

Tendon Strain Apparatus

A Non-Contacting Solution for Strain Analysis of Soft Tissue

University of Idaho
College of Engineering



The Dev-elopers

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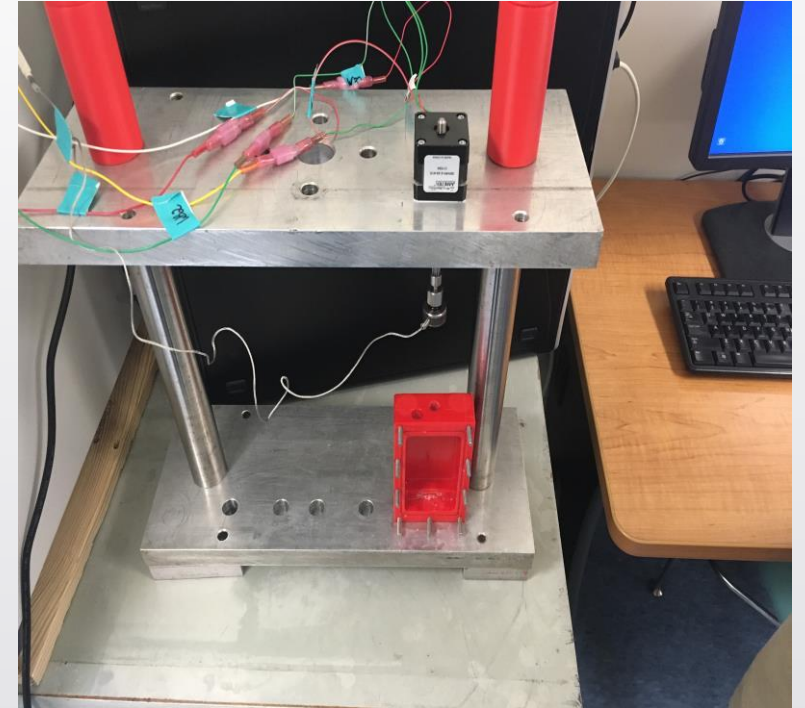
Dr. Nathan Schiele – Client

Dr. Dev Shrestha – Lead Instructor



Concept

- Non-Contacting Video System
- Description of old system
- Streamlined, updated current recording techniques



Design Considerations

- Three integrated components:
 - Recording system (camera and lens)
 - Background code (LabVIEW)
 - Attachment system (mounting arm)
- Must be autonomous, durable, user-friendly



Camera & Lens

What we wanted:

- Small
- High resolution
- Live feed to LabVIEW
- Cost efficient



Camera Features:

- Compact & Lightweight
- 1280x1024 resolution
- Easy USB hookup
- Cost efficient

Lens Features:

- 8mm focal length
- Manual focus
- Compact

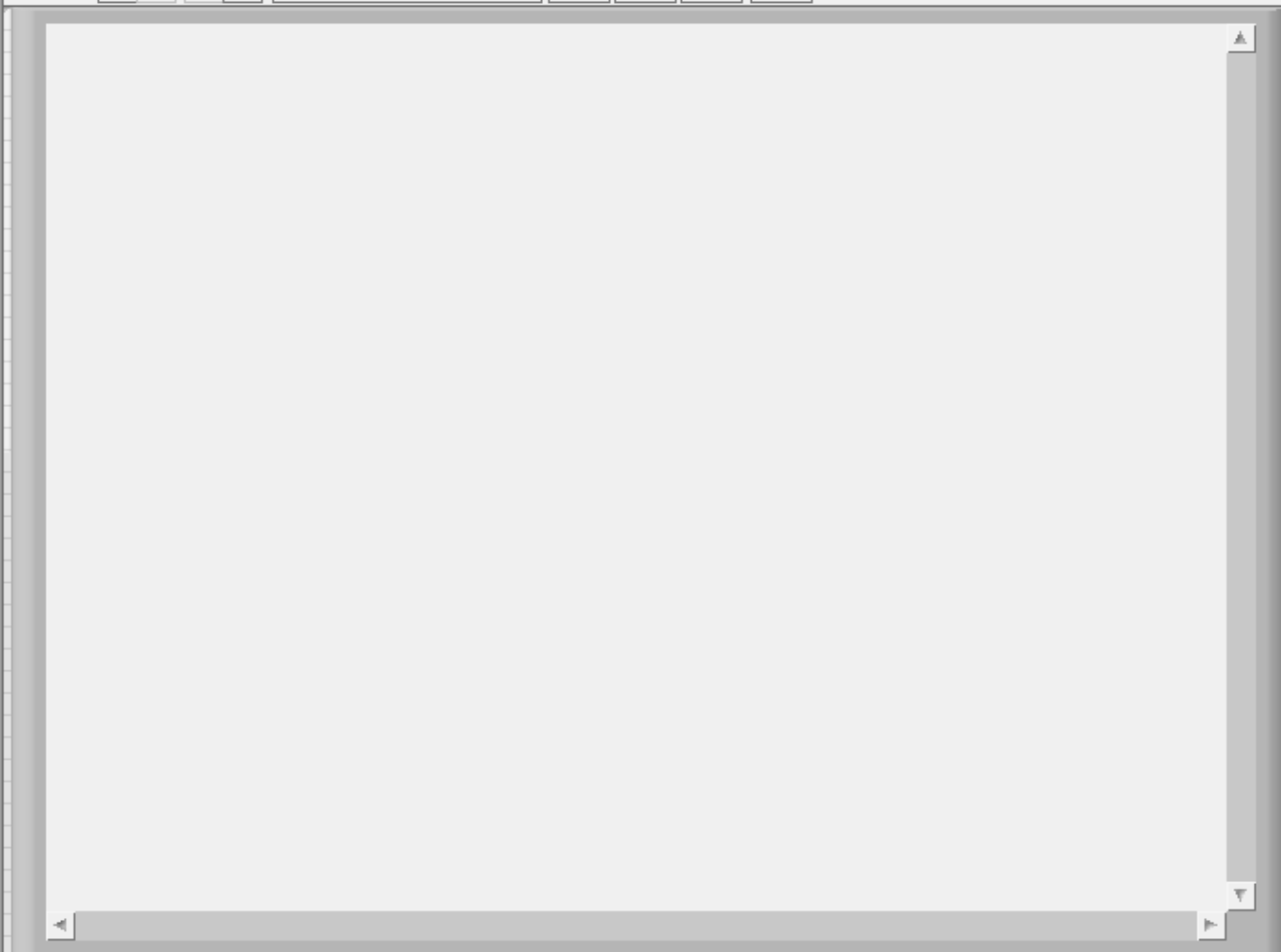
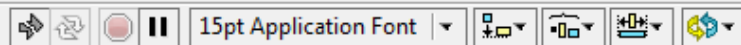


Programming Software


Why did we choose to focus our code in LabVIEW?

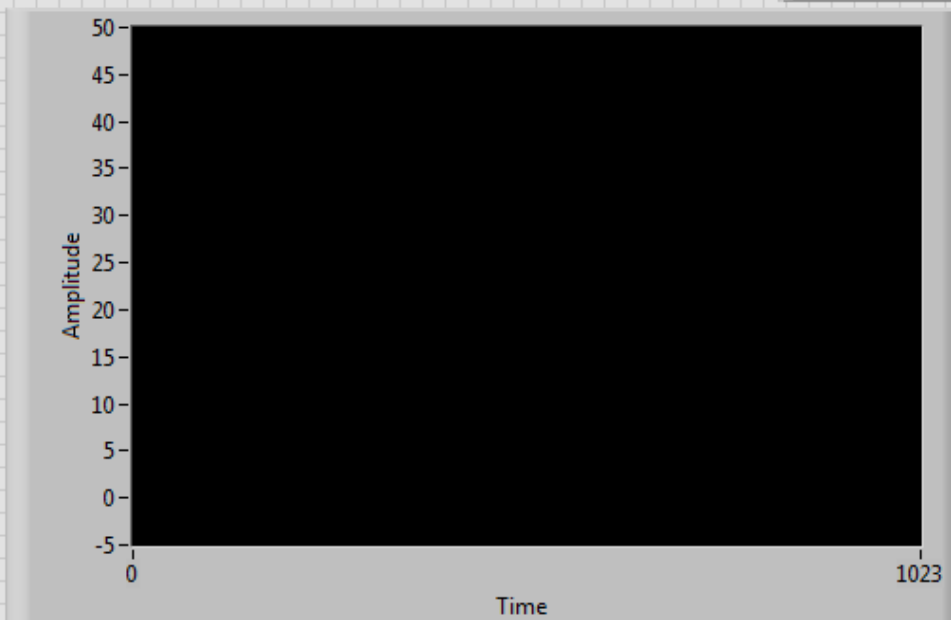
- Our team had some LabVIEW knowledge
- Easy to use front panel
- User friendly GUI
- Client & researchers had previous experience in LabVIEW

File Edit View Project Operate Tools Window Help



Waveform Chart

Plot 0 



Stop (F)



Strain

0

Number of Matches

0

Displacement

0

vision error

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<div></div>	

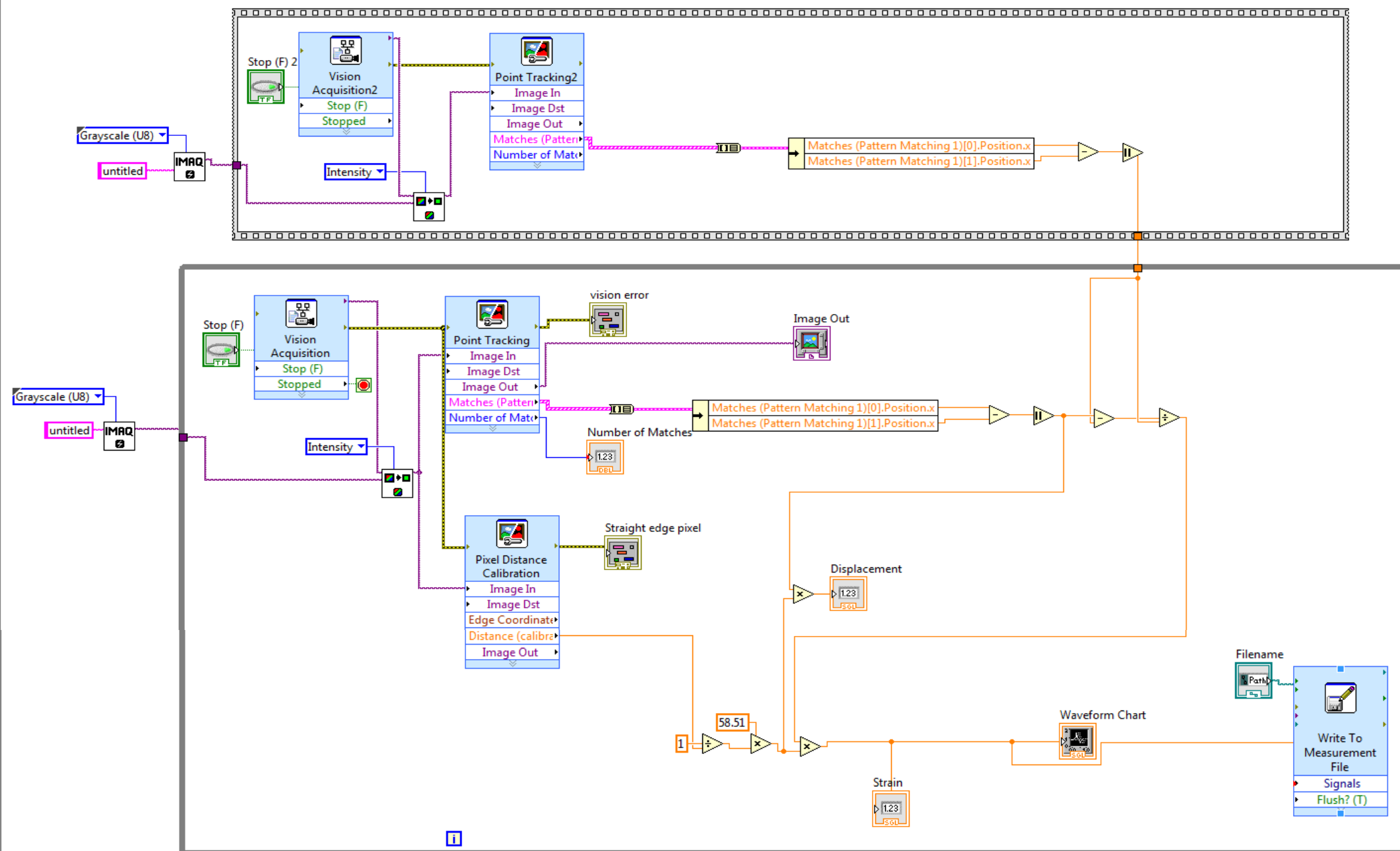
Straight edge pixel

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Filename

test.lvm





Mounting



SolidWorks Model

- Initially intended to use a 3D-printed model
- Adjustable in three dimensions to allow for flexible camera positioning
- Clamps onto a bar inside of the incubator, with the camera attached at the opposing end



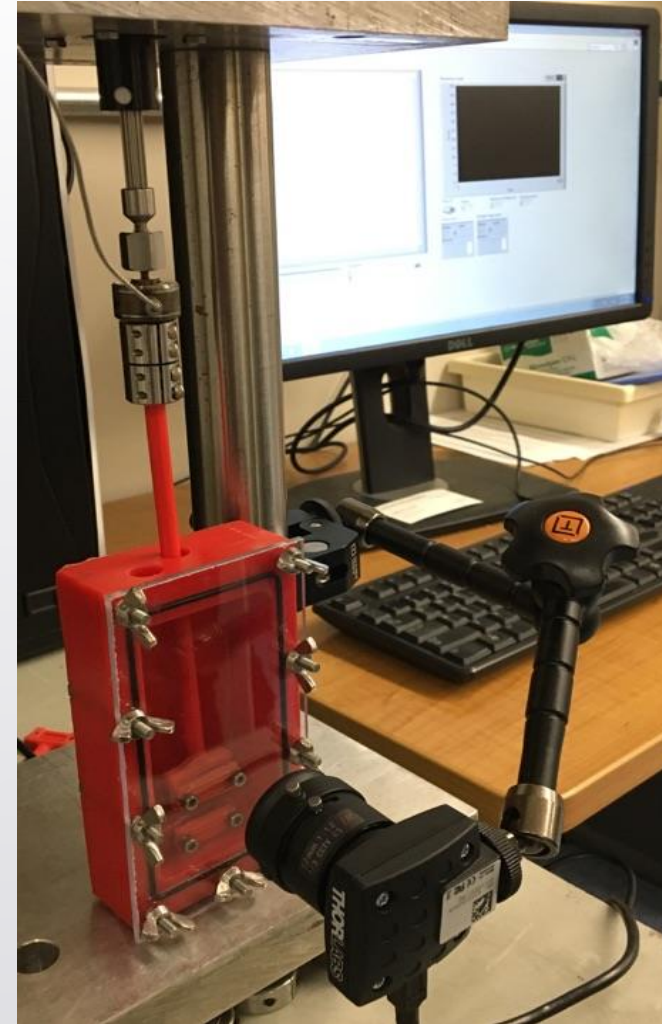
Tether Tools 7" Articulating Arm

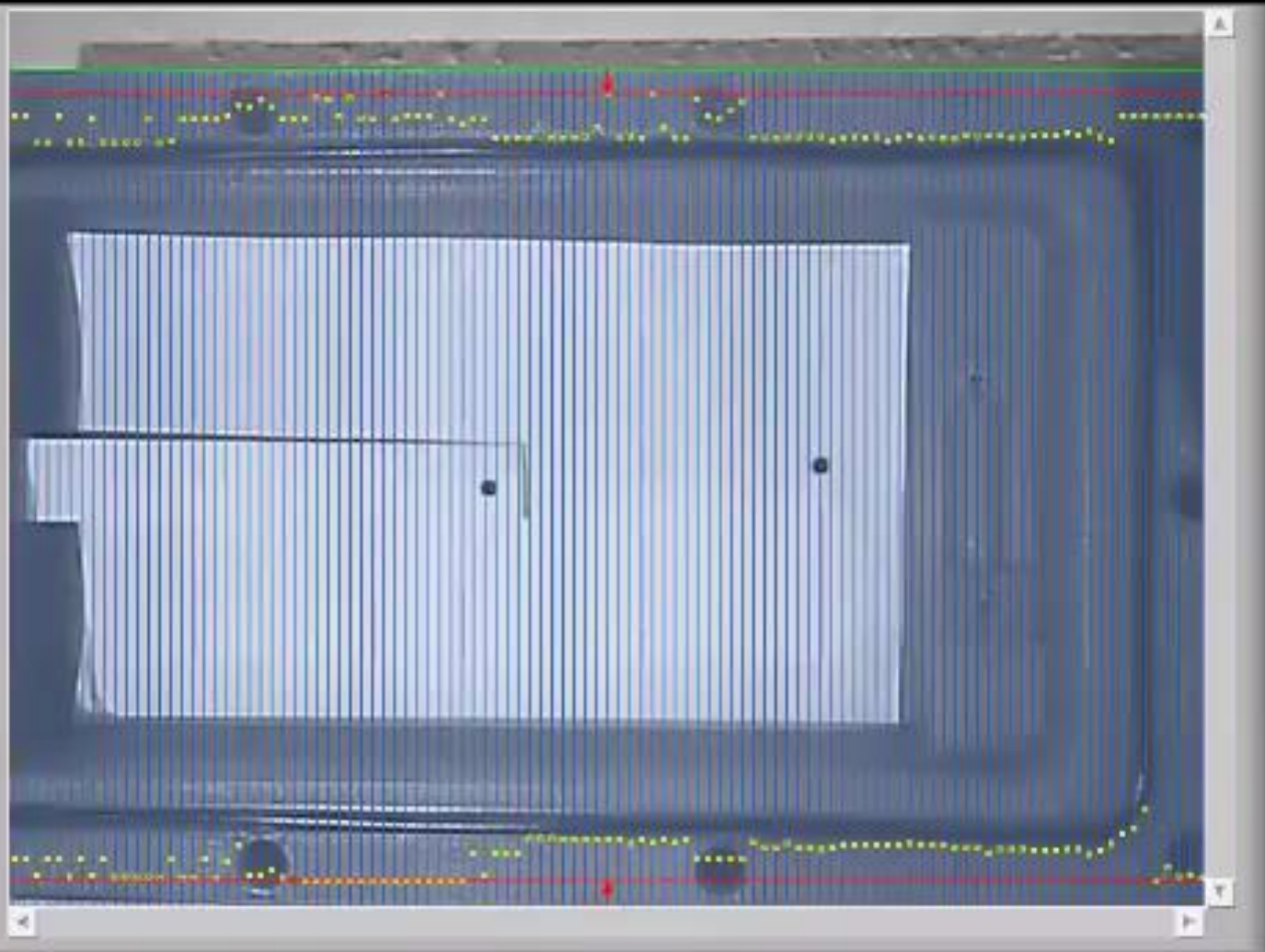
Project Summary

- Current systems value in the thousands.

Project Budget Breakdown

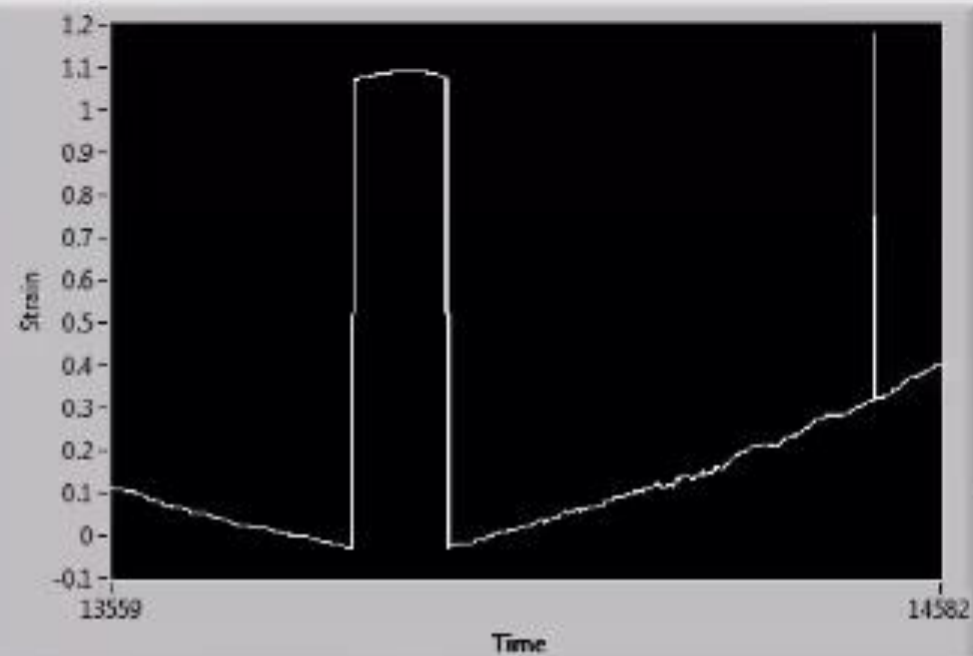
Camera	\$365
Lens	\$85
Articulating Arm	\$96
MATLAB Data Acquisition Software	\$87
Expo Poster	\$80
Snapshot Posters	\$52
Total Expenses	\$765
Budget Remaining	\$735





Waveform Chart

Plot 0



Stop (F)



Strain

0.402354

Number of Matches

2

Displacement

24.6743

vision error

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Straight edge pixel

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Thank you
Questions?